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NOTES ON FRESH-WATER RHIZOPODS OF SWATOW, CHINA.

BY ADELE M. FIELDE.

During the month of February, in ooze taken from the pools and ditches near my house, and preserved in soup-plates under water an inch in depth, I have seen *Amœba radiosa*, *Amœba verrucosa*, *Diffugia pyriformis*, *Diffugia acuminata*, *Diffugia cornuta*, *Diffugia corona*, *Diffugia nodosa*, *Diffugia compressa*, *Diffugia spiralis*, *Diffugia lobostoma*, *Diffugia globulosa*, *Arcella vulgaris*, *Arcella discoides*, *Centropyxis aculeata*, *Centropyxis eornis*, with the empty shells of *Euglypha alveolata*, and the Heliozoans, *Actinophrys sol*, *Actinophrys picta*, *Actinosphaerium*, and *Acanthocystis*. Of *Diffugia spiralis*, the greater number had shells formed of vermicular pellets. In *Diffugia lobostoma* the mouth of several specimens seen, was six lobed, and the shell of a glossy brown, ovoid or spherical, and so constructed of oval plates mingled with sand grains as to resemble *Nebela*. I have also seen several empty shells of *Diffugia cratera*, of bright brown membrane, and of the shape shown in Fig. 20, Plate XII, in Leidy's work on Rhizopods. These shells were only $\frac{1}{1000}$ of an inch in length, and had no sand grains adherent.

All the above species and varieties having been fully described and illustrated by Leidy, in his book on the Fresh-water Rhizopods of North America, I note their presence here only in order to record the interesting fact of their wide distribution.

In addition to the above, I have found another species, not described by Leidy, which has been identified with *Diffugia triangulata*, Lang, (*Diffugia bipes*, Carter). From the cancellated character of the shell this form probably belongs to the genus *Nebela*, Leidy. Another species observed is probably the *Nebela collaris*, Leidy.

The specimens of the form regarded as *Diffugia* (*Nebela*) *triangulata* vary but little in size in a great number of specimens observed, averaging $\frac{1}{100}$ of an inch in length, with a mouth $\frac{1}{1000}$ of an inch in diameter; with two horns on the lateral borders of the fundus, the horns being usually $\frac{1}{1000}$ of an inch in length, and placed in different specimens at very different angles to the long axis of the shell. In some specimens a protuberance rises midway between the horns. The greatest diameter of the shells

varies considerably with the inclination of the horns, a difference of $\frac{1}{1000}$ of an inch being observed in different specimens having the same length, $\frac{1}{400}$ to $\frac{1}{500}$ of an inch being common. The transverse diameter is always about half that of the broad diameter,—narrowing gradually to the cylindroid mouth. The hexagonal cancellations are about $\frac{1}{4000}$ of an inch in diameter, their regularity varying. The sarcode in the specimens observed occupied not more than half the interior capacity of the shell, pyriform in shape, with never more than three pseudopods projected. A current of water directed into the mouth of a shell, caused, in one instance, the *instant* retraction of two long pseudopods, and the carrying of the whole mass of sarcode to the fundus of the shell.

The shell of *Nebela collaris*, Leidy, is obovate in the broad aspect, and the fundus is edged with what looks like a row of tiny bubbles. In the lateral aspect, the shell is generally pyriform, with an acute fundus. The length of the shell is about $\frac{1}{250}$ of an inch, and its greatest breadth $\frac{1}{300}$, the proportions varying but slightly in many specimens observed. The sarcode is the same as in *Diffugia cornuta*, and many specimens were observed with the sarcode formed into a ball in the center of the shell. The sarcode of all specimens seen, contained numerous brown granules and brown or greenish food-balls, similar in color to the diatoms and desmids associated with all these Rhizopods.